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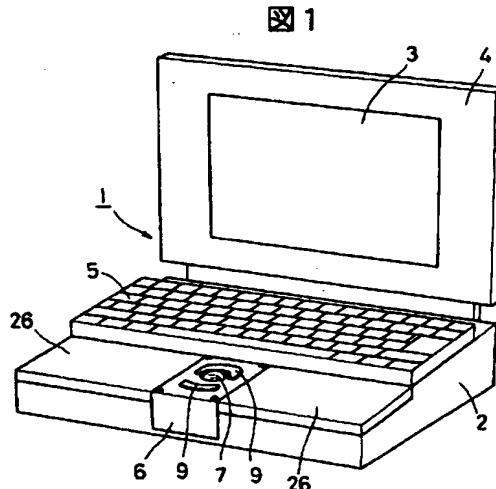
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(54)【発明の名称】 入力装置およびその入力装置を備えたコンピュータ処理装置

(57)【要約】 *Abstract*

【目的】 コンパクトでしかも簡単な入力操作ができる入力装置とこれを備えているコンピュータ処理装置を提供する。

【構成】 パソコン1における本体2に対し着脱自在となっており、マウスボールとしての機能を備えているトラックボール7とクリックボタン9とを有している入力装置6とし、また入力装置6を備えているパソコン1としている。そのために、トラックボール7を操作する場合においてはパソコン1に取り付けた状態において使用することができ、入力装置6はトラックボール7をマウスボールとして操作する場合においてはパソコン1から取り外して入力装置6を机の上などに載せて操作することができる。



1: パソコン 7: トラックボール  
2: 本体 9: クリックボタン  
6: 入力装置

## PATENT ABSTRACTS OF JAPAN

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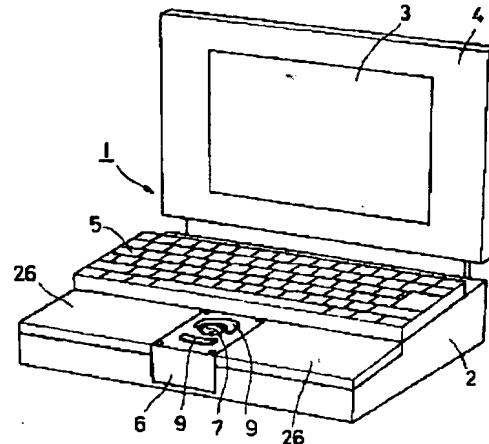
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YAMAMOTO YASUHIKO  
HIRAMATSU TAKASUMI  
FUJISAWA YUKARI**(54) INPUT DEVICE AND COMPUTER PROCESSOR  
CONTAINING THE SAME****(57) Abstract:**

**PURPOSE:** To provide a compact input device which can easily perform the input operations and also to provide a computer processor which contains the input device.

**CONSTITUTION:** The input device 6 can be freely loaded into and unloaded out of a main body 2 of the personal computer 1 and has a trackball 7 which contains the function of a mouse ball and a click button 9. In other words, the computer 1 contains the device 6. Therefore the trackball 7 can be operated while it is attached to the computer 1. When the trackball 7 is operated as a mouse ball, the device 6 is removed from the computer 1 and can be operated on a desk, etc.

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Partial Translation of Japanese Laid-Open Patent Application No. 7-261928

Input Device and Computer Processor containing the same

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[TITLE OF THE INVENTION]

Input Device and Computer Processor containing the same

[ABSTRACT]

[PURPOSE]

There is provided a computer processing apparatus provided with an input device which is designed compact and assures simplified input manipulation.

[CONSTITUTION]

An input device 6 comprising a track ball 7 having the function as a mouse ball and a click button 9 is loaded to be removable to a body 2 of a personal computer 1. Therefore, when the track ball 7 is manipulated, the input device can be used under the condition that it is loaded to the personal computer 1 and the input device 6 can be manipulated under the condition that it is taken out from the personal computer 1 and is placed, for example, on the desk when the track ball 7 is manipulated as the mouse ball.

**[CLAIMS]****[Claim 1]**

An input device, comprising a track ball as the mouse ball and click buttons, which may be loaded to be removable to a computer processing apparatus.

**[Claim 2]**

An input device, comprising a track ball and click buttons at the surface and also comprising a mouse ball at the rear surface, which may be loaded to be removable to a computer processing apparatus.

**[Claim 3]**

An input device, comprising a track ball having the function as the mouse ball and click buttons, which may be loaded to be removable to a computer processing apparatus.

**[Claim 4]**

An input device as claimed in claim 1, 2 or 3, wherein said track ball can be moved upward or downward and can also be set in its position for the body thereof.

**[Claim 5]**

A computer processing apparatus including an input device, comprising a track ball, a mouse ball and click buttons in the body, which can be loaded to be removable for said computer processing apparatus.

**[Claim 6]**

A computer processing apparatus including an input device, comprising a track ball having the function as a mouse ball and click buttons in the body, which can be loaded to be removable to said computer processing apparatus.

**[Claim 7]**

A computer processing apparatus as claimed in claim 5 or 6, introducing a personal computer, word processor or a mini-computer as the processing apparatus.

**[0012]****[Means for Solving the Problem]**

Outlines of the typical inventions among the inventions disclosed in the present invention will be explained below.

**[0013]**

An input device of the present invention is comprising a track ball, a mouse ball and click buttons and can be loaded to be removable to a computer processing apparatus and a computer processing apparatus of the present invention comprises said input device.

**[0014]****[Operation]**

According to the input device of the present invention, any one desired of the track ball or mouse ball can be manipulated freely as required using only one input device by using

the input device, when the track ball is manipulated, under the condition that the input device is mounted to the computer processing apparatus and by taking out the input device from the computer processing apparatus and then manipulating it, when it is manipulated as the mouse ball, under the condition that it is placed, for example, on a desk.

[0015]

[Preferred Embodiments]

Preferred embodiments of the present invention will be explained in detail with reference to the accompanying drawings. The like elements having the like functions are designated by the like reference numerals throughout the drawings and the same explanation is not duplicated.

[0016]

(Embodiment 1)

Figs. 1 to 6 show an input device as an embodiment of the present invention and a personal computer comprising the same input device. Fig. 1 is a perspective view of a personal computer comprising the input device of this embodiment, Fig. 2 is a perspective view showing the condition that the input device is taken out from the personal computer body and can be moved freely, Fig. 3 is a perspective view showing the input device, Fig. 4 is a side elevation showing the input device with a partial sectional view, Fig. 5 is a plan view showing the condition that the track ball of the input device is removed and Fig. 6 is a plan view showing a circular plate having the rotating axis of the input device. In Fig. 1 to Fig. 6, it should be noted that sizes in the drawings are different in each drawing to make clear the illustration of the drawings.

[0017]

As shown in Fig. 1 and Fig. 2, the personal computer 1 is a portable type personal computer, consisting of a body 2 and a cover 4 comprising a display 3 including the liquid crystal display screen.

[0018]

The body 2 is comprising a central processing unit (CPU) not illustrated, a fixed disk and a battery. The hardwares comprising the softwares as the general programs such as system softwares and application softwares are also comprised to execute various arithmetic calculations, processings and storing.

[0019]

Moreover, at the surface of the body 2, the keyboard 5 fixed to the body 2 and the input device 6 which can be loaded to or unloaded from the body 2 are also mounted.

[0020]

The keyboard 5 is used to input characters, numerals and symbols to give instruction to the hardwares.

[0021]

The input device 6 has the function to transfer the data and instructions to the

hardwares comprised in the body 2 in place of typing on the keyboard 5 and also includes the function as the track ball 7 to be manipulated by the palm of a hand and the function as the mouse manipulated through the movement on the flat surface like the surface of desk.

[0022]

As shown Figs. 3 to 6, the input device 6 is provided with the track ball 7 which is partly projected to the surface of the body 8. The track ball 7 may also be used as the mouse ball having the function as the mouse. Moreover, the track ball 7 is formed of a spherical body made of plastic. The surface layer of the track ball is covered with a high friction material such as a hard rubber to enhance a dynamic friction force against the flat area such as the surface of desk when it is used as the mouse ball.

[0023]

Moreover, at the surface of the apparatus body 8, the click buttons 9 for turning ON and OFF the switches and spherical projected bodies 10 provided at the four corners to keep the constant height when the track ball 7 is used as the mouse ball are provided. Here, two click buttons 9 are provided for the convenience of manipulation and it is also possible to provide only one click button from the functional viewpoint.

[0024]

The projected bodies 10 are formed as the spherical projected bodies to keep constant the height of the projected portion of the track ball 7, when the track ball 7 used as the mouse ball of the mouse is slid on the surface of desk, the friction surface can be reduced and thereby the easily movable mouse structure can be attained.

[0025]

Moreover, at the rear surface of the body 8, the click button 11 to turn ON and OFF the switch when the track ball 7 is used as the mouse ball is also provided.

[0026]

The track ball 7 is loaded to a box 12 which can be moved upward or downward for the apparatus body 8, the box 12 is coupled for the apparatus body 8 with a plurality of springs 13 and the box 12 can be sunk against the apparatus body 8 by clamping the track ball 7. The spring 13 works as an elastic body when the box 12 is moved upward or downward and it can be replaced by various elastic bodies having elasticity such as spring, rubber, sponge and air cushion, etc.

[0027]

Numeral 14 designates a projected portion provided on the apparatus body having the function to regulate the upper and lower limits of the box 12.

[0028]

Numeral 15 designates a cavity portion provided on the apparatus body 8 in order to accommodate, when the function as the track ball 7 is used, a disk plate 16 for positioning the box 12 to the apparatus body 8.

[0029]

The disk plate 16 has a shape including the cutting portions at the peripheral area as shown in the plan view of Fig. 6 and it is mounted to a rotating shaft 17. A broken line in Fig. 6 indicates the circumference portion when the disk plate 16 having no cutting portion is assumed. When the disk plate 16 is manually rotated, the circumference portion of the disk plate 16 is projected to the inside of the apparatus body 8 and is in contact with the bottom surface of the box 12. Moreover, when the disk plate 16 is rotated for the predetermined amount, the cutting portion of the disk plate 16 can be arranged at the inside of the apparatus body 8. In this condition, the disk plate 16 is no longer in contact with the bottom surface of the box 12, allowing it to move upward and downward.

[0030]

In addition, since the disk plate 16 is mounted not to be projected to the surface area of the input device 6, any problem is not generated when the input device 6 is manipulated and when it is loaded to the body 2 of personal computer 1.

[0031]

Numeral 18 designates a connector for electrical connection of the input device 6 by providing a cable 19 as the extended electrical wiring to the connector (not illustrated) provided to the body 2 of the personal computer 1.

[0032]

As shown in Fig. 5, when the track ball 7 is removed from the input device 6, a cylindrical rotating body 20 for detecting the rotating amount in the right and left directions on the drawing of the track ball 7 and its rotating shaft 21, a cylindrical rotating body 22 for detecting the rotating amount in the upper and lower directions on the drawing of the track ball 7 and its rotating shaft 23 and a cylindrical rotating body 24 for assuring balanced positioning of the track ball 7 to realize smooth rotation thereof and its rotating shaft 25 can be found at the inside of the box 12 of the input device 6.

[0033]

Rotation of the track ball 7 is detected by the rotating bodies 20, 22 and then converted to an electrical signal by an electrical circuit (not illustrated) and is finally transferred to the body 2 of personal computer 1 via the cable 19 and connector 18. Thereby the cursor of the display unit 3 can be moved in the horizontal and vertical directions depending on the amount of rotation of the track ball 7.

[0034]

The input device 6 is used, when the function as the track ball 7 is used, under the condition that it is mounted to the body 2 of the portable personal computer 1.

[0035]

Moreover, the input device 6 can be used as the mouse, when the track ball 7 is used as the function of the mouse ball, by taking out from the body 2 of personal computer 1 as shown in Fig. 2 and then using on the desk surface by rotating 180 degrees the surface of the apparatus body 8 from which the track ball 7 is projected from the surface.

[0036]

In this case, as shown in Fig. 2, the connector 18 explained above is connected to the connector (not illustrated) provided to the body 2 of the personal computer 1. In the connector area of the body 2, a space is provided to accommodate the cable 19 and a flat plate 26 which can be moved in the horizontal direction is provided on the space. The flat plate 26 is mounted to move in the horizontal direction for the body 2 by means of a catching groove including the projected area and recessed area (not illustrated) so that it can slide as required on the space area where the input device 6 is removed for manipulation to form the same flat surface as the right side flat plate 26 (having the structure similar to that of the left side flat plate 26 and can move in the horizontal direction) and to be moved to the left side for accommodation into the space area by folding the cable 19. As the accommodation structure of the cable 19, various modifications such as the structure to make small the volume of space area by winding in compact the cable into the body 2 of the personal computer 1 can be applied. Moreover, various structures may also be introduced for the flat plate 26 and coupling between the flat plate and body 2.

[0037]

When the input device 6 is used for the function of track ball 7, the disk plate 16 is rotated to mount the box 12 to the apparatus body 8.

[0038]

Since the box 12 is positioned to the apparatus body 8 by rotating operation of the disk plate 16, the input device 6 operates without any problem even when the track ball 7 is rotated and the click buttons 9 are depressed.

[0039]

The input device 6, when it is taken out from the body 2 of the portable personal computer 1 for the function of mouse, rotates the disk plate 16 to move the cutting portion. Thereby, the projected portion of the disk plate 16 for positioning the box 12 is caused to disappear so that the box 12 can be moved in the vertical direction and the function as the mouse can be realized without any problems.

[0040]

That is, since the input device 6 is turned by 180 degrees and is placed on the desk surface, the spring 13 of the input device 6 is sunk and the track ball 7 functions as the mouse ball. Moreover, the input device 6 can also realize the function as the mouse without any problem by using the click buttons 11 when it is used as the mouse.

[0041]

(Embodiment 2) Fig. 7 is a side elevation of the input device 27 as the other embodiment of the present invention.

[0042]

As shown in Fig. 7, the input device 27 of this embodiment 2 has the function to transfer the data and instructions to the hardwares comprised in the body 2 in place of the

typing operation of the keyboard 5 in the embodiment 1. This function covers the function as the track ball 7 to be manipulated by the palm of a hand and the function as the mouse ball 23 to be manipulated on the flat area such as on the surface of desk.

[0043]

Moreover, a couple of click buttons 30 to turn ON and OFF the switch are provided at the surface of the apparatus body 29 of the input device 27 for manipulation of the track ball 7 or mouse ball 28. In addition, at the rear surface of the apparatus body 29, a spherical projected body 10 is provided at four corners to specify the constant projected height when the mouse ball 28 is used. The click button 30 can be manipulated when the track ball 7 is used and mouse ball 28 is used and any one of the click button 30 can be used as required for the convenience of process. Here, a couple of click buttons 30 are provided because of convenience of process and there is no problem on the function if any one click button is provided.

[0044]

The projected body 10 is designed as the spherical projected body to keep constant the height of the projected part of the mouse ball 28. Therefore, when the mouse ball 28 is placed on the desk surface and it is then slid, the friction surface can be reduced effectively and the mouse can be moved easily.

[0045]

The track ball 7 is loaded to be moved in the vertical direction for the apparatus body 29. When the switch which is not illustrated is depressed, the track ball 7 is fixed it cannot be moved by the palm of a hand while the mouse ball 28 is manipulated.

[0046]

Numeral 18 designates a connector for electrical connection of the input device 27 to the connector (not illustrated) provided to the body 2 of the personal computer 1.

[0047]

The input device 27 is used under the condition that it is mounted to the body 2 of the portable personal computer 1 when the function as the track ball 7 is required.

[0048]

Moreover, the input device 27 is taken out from the body 2 of the personal computer 1 when the function as the mouse ball 28 is required and the switch is depressed after the track ball 7 is clamped. Thereby, the track ball 7 can be fixed and the function of mouse can be realized without any problem by placing the mouse ball 28 on the desk surface.

[0049]

The input device 27 can manipulate the track ball 7 without any problem under the condition that it is mounted to the body 2 of personal computer 1 and when it is requested to be used as the mouse, it is taken out from the body 2 of the personal computer 1 and the mouse ball 28 is manipulated to realize the function as the mouse without any problem.

[0050]

The input devicees 6, 27 are applied to a portable personal computer but the input device of the present invention can be used for various computer processing apparatuses such as a desk top type personal computer, wordprocessor or mini-computer and thereby the present invention can provide a compact input device which assures higher flexibility for use and also provide a computer processing apparatus provided with the input device explained above.

[0051]

The invention of the present invention has been explained with reference to the preferred embodiments but the present invention is not limited thereto and allows various modification without departure from the scope of the claims.

[0052]

[Effect of the Invention]

Effects of the typical inventions of those disclosed in the present invention will be explained briefly as follow.

[0053]

According to the present invention, there are provided an input device which can be mounted to be removable to a computer processing apparatus comprising track ball, mouse ball and click buttons and a computer processing apparatus provided with the input device. Thereby, when it is requested to manipulate the track ball, the input device can be used by mounting to the computer processing apparatus, and when it is requested to manipulate the mouse ball, the input device is taken out from the computer processing apparatus and is placed on the surface of desk. Thereby, any one of the track ball and mouse ball can be manipulated freely as required with only one input device.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[Fig. 1]

Perspective view showing a personal computer comprising an input device as a preferred embodiment of the present invention.

[Fig. 2]

Perspective view showing the condition that the input device is taken out from the body of personal computer to realize free movement thereof as an embodiment of the present invention.

[Fig. 3]

Perspective view showing the input device as a preferred embodiment of the present invention.

[Fig. 4]

Side elevation showing a part of the sectional view of the input device as a preferred embodiment of the present invention.

[Fig. 5]

Plan view showing the condition that the track ball of the input device as a preferred

embodiment of the present invention is removed.

[Fig. 6]

Plan view showing a disk plate having a rotating shaft of the input device as a preferred embodiment of the present invention.

[Fig. 7]

Side elevation showing the input device of another preferred embodiment of the present invention.

[DESCRIPTION OF THE REFERENCE NUMERALS]

- 1. ....Personal computer; 2.....Body;
- 3.....Display unit; 4.....Cover; 5.....Keyboard;
- 6.....Input device; 7.....Track ball;
- 8.....Apparatus body; 9.....Click button;
- 10....Projected body; 11....Click button;
- 12....Box; 13.....Spring; 14.....Projected portion;
- 15....Space area; 16.....Disk plate;
- 17....Rotating shaft; 18.....Connector;
- 19....Cable; 20.....Rotating body;
- 21....Rotating shaft; 22.....Rotating body;
- 23....Rotating shaft; 24.....Rotating body;
- 25 . ...Rotating shaft; 26.....Flat plate.